EOS Production Sites
Network Performance Report: March 2015

This is a monthly summary of EOS network performance testing between production sites – comparing the measured performance against the requirements. Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, Issues in Orange, and other comments in Blue.

Highlights:

- **Mostly stable flows**
  - **GPA: 3.67** ↓ (was 3.69 last month)
- **MODIS Reprocessing Active** – mostly to EROS (averaged 475 mbps)
- **JPL:** JPL had a problem with 1 of 4 10 gig ethernets which were aggregated into an etherchannel. This caused high packet loss and low performance when a flow was assigned to the lossy ethernet. Thus most flows were NOT affected, and those flows which were affected were only affected some of the time. This problem was fixed in late February, and the flows stabilized and improved.
- **Requirements**: using the Network Requirements Database for 2014
  - Including GPM, OCO2, and SMAP missions
  - MODIS and AMSR Reprocessing requirements included
- **Only 2 flows below Good**
  - **GSFC → EROS: Low**
  - **NOAA → GSFC-NPP-SD3E: Low**
    - Probably just a problem with the NOAA test node

Ratings Changes:

Upgrade: ↑ None

Downgrades: ↓ **GSFC → EROS: Almost Adequate → Low**

Due to MODIS reprocessing flow

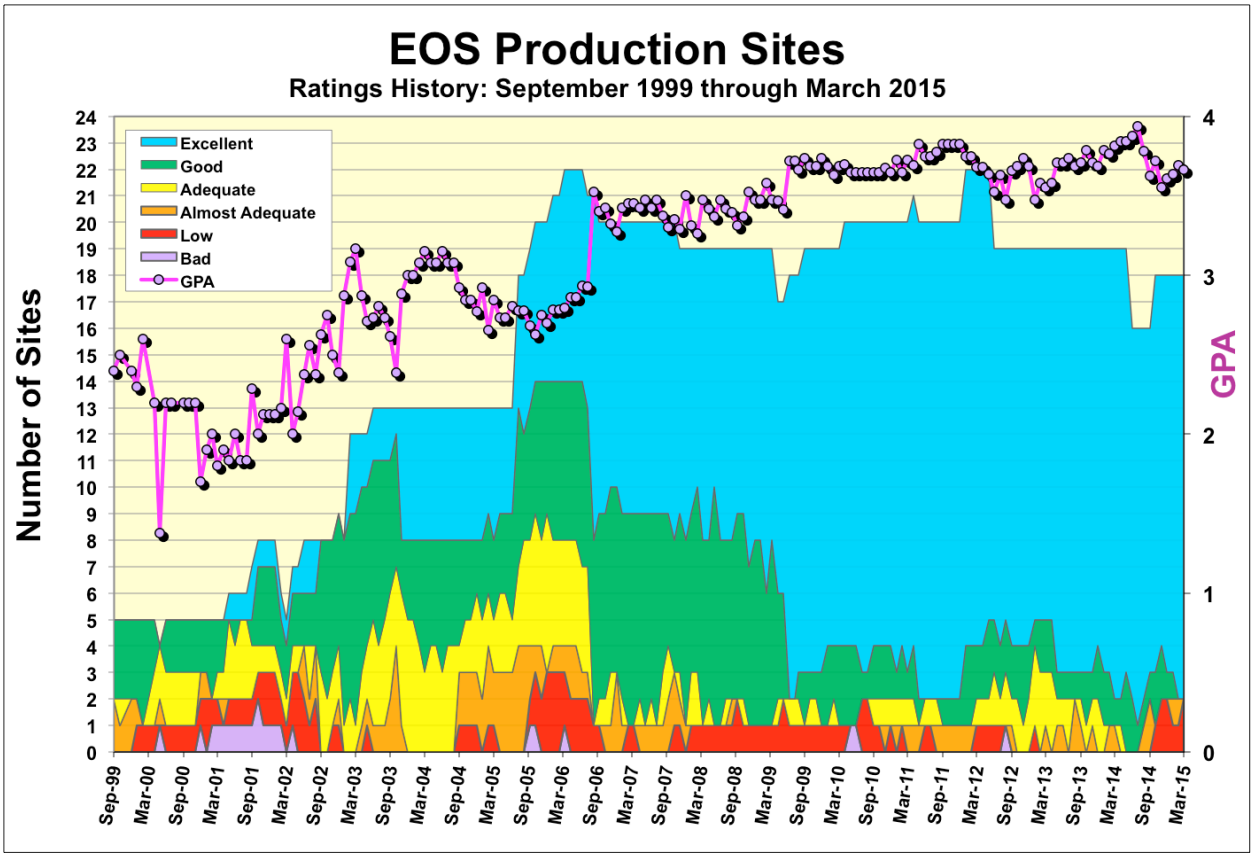
Ratings Categories:

Rating	Value	Criteria
Excellent:	**4**	**Total Kbps** > Requirement * 3
Good:	**3**	1.3 * Requirement <= **Total Kbps** < Requirement * 3
Adequate:	**2**	Requirement < **Total Kbps** < Requirement * 1.3
Almost Adequate:	**1.5**	Requirement / 1.5 < **Total Kbps** < Requirement
Low:	**1**	Requirement / 3 < **Total Kbps** < Requirement / 1.5
Bad:	**0**	**Total Kbps** < Requirement / 3

Where Total Kbps = Average Integrated Kbps (where available), otherwise just iperf

Note that "**Almost Adequate**" implies meeting the requirement excluding the usual 50% contingency factor.

Ratings History:



The chart above shows the number of sites in each rating category since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance – they are relative to the EOS requirements.

Additions and deletions:

2011 April: Added RSS to GHRC
2011 May: Deleted WSC to ASF for ALOS
2012 January: Added NOAA → GSFC-SD3E
Added GSFC-SD3E → Wisconsin
2012 June: Deleted GSFC → LASP
Deleted GSFC ← → JAXA
2014 June: AMSR-E no longer producing data
Deleted JPL to RSS and RSS to GHRC
Deleted JPL to NSIDC
2014 October: Added JPL to NSIDC requirement for SMAP
Added GSFC to GHRC requirement for LANCE

Requirements Basis:

In June 2014, the requirements were updated to the latest values in the database!

- Added flows for GPM, OCO2, and SMAP (effective FY '15) missions
- Removed AMSR-E, ICESAT flows (AMSR-E reprocessing remains included)
- MODIS reprocessing incorporated month-by-month
  - Reprocessing requirement began 2014 August

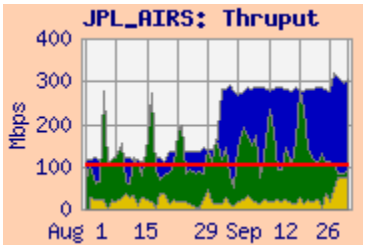
In June 2012, the requirements were switched, to use the EOSDIS network requirements database.

Previously, the requirements were based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Prior to that, the requirements were derived from version 1.4.2.

One main difference between Handbooks 1.4.2 and 1.4.3 is that in 1.4.3 most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated either between the per-orbit flows, or within the built-in contingency. Previously, these flows were added in linearly to the requirements, making the requirements unrealistically high.

Additionally, the contingency for reprocessing flows greater than 2X reprocessing was reduced. These flows WERE a major component of the contingency, so adding additional contingency on top of these flows was considered excessive.

Integrated Charts:



Integrated charts are included with site details, where available. These charts are "Area" charts, with a "salmon" background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example – unless otherwise stated, not the flows to the specific nodes) to the destination facility (JPL, in this example) obtained from routers via "netflow".

The green area is stacked on top of the user flow, and represents the "adjusted" daily average iperf thruput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. Adjustments are made to compensate for various systematic effects, and are best considered as an approximation.

The red line is the requirement for the flow from the source to destination facilities. On some charts a blue area is also present – usually "behind" the green area – representing adjusted iperf measurements from a second source node at the same facility.

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Network Requirements vs. Measured Performance

March 2015		Requirements (mbps)		Testing				Ratings	
Source ➔ Destination	Instrument (s)	Current FY '15	Old FY '12	Source ➔ Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re FY '15 Requirements: This Month	Ratings re FY '15 Requirements: Last Month
GSFC ➔ EROS	MODIS, LandSat	1016.2	548.4	MODAPS-PDR ➔ EROS LPDAAC	475.1	220.8	538.8	Low	A A
GSFC ➔ JPL	AIRS, MLS, NPP, TES, OCO2, SMAP	121	63.0	NPP SD3E OPS1 ➔ JPL-AIRS	108.0	714.8	722.5	Excellent	Ex
JPL ➔ GSFC	MLS, OCO2	11.9	0.57	JPL-PODAAC ➔ GSFC GES DISC	14.5	573.2	579.6	Excellent	Ex
LaRC ➔ JPL	TES, MISR	83.5	83.5	LARC-ASDC ➔ JPL-TES	17.2	651.4		Excellent	Ex
JPL ➔ LaRC	TES	1.1	1.1	JPL-TES ➔ LARC-PTH	0.72	775.5	775.5	Excellent	Ex
GSFC ➔ LaRC	CERES, MISR, MOPITT, TES, MODIS	60.7	52.2	GSFC EDOS ➔ LaRC ASDC	50.8	901.9	904.0	Excellent	Ex
LaRC ➔ GSFC	MISR	0.6	0.6	LARC-ASDC ➔ GES DISC	0.89	934.3	934.3	Excellent	Ex
JPL ➔ NSIDC	AMSR-E, SMAP	17.1	0.16	JPL-SMAP ➔ NSIDC	11.83	622.0		Excellent	Ex
NSIDC ➔ GSFC	AMSR-E, MODIS, ICESAT	0.009	0.017	NSIDC DAAC ➔ GES DISC	8.67	627.8	629.0	Excellent	Ex
GSFC ➔ NSIDC	AMSR-E, MODIS, ICESAT, GBAD	38.5	8.4	MODAPS PDR ➔ NSIDC-DAAC	69.6	371.1	407.5	Excellent	Ex
GHRC ➔ NSIDC	AMSR-E	5.14	2.08	GHRC ➔ NSIDC DAAC	0.024	19.72	19.72	Excellent	Ex
GSFC ➔ GHRC	AMSR-E, MODIS	2.9	0.00	GSFC EDOS ➔ GHRC via NISN	17.4	16.5	20.9	Excellent	Ex
NOAA ➔ GSFC	NPP	601.3	522.3	NOAA-PTH ➔ GSFC NPP-SD3E OPS1	215.3	221.5	280.9	Low	Low
GSFC ➔ Wisc	NPP, MODIS, CERES, AIRS	264.2	259.1	GSFC NPP-SD3E OPS1 ➔ WISC	125.8	1257.3	1257.3	Excellent	Ex
LaRC ➔ NCAR	MOPITT	0.044	0.044	LaRC-PTH ➔ NCAR		177.7		Excellent	Ex
GSFC ➔ JAXA	TRMM, AMSR-E, MODIS, GPM	15.4	3.5	GSFC-EBnet ➔ JAXA	36.6	n/a		n/a	n/a
JAXA ➔ GSFC	AMSR-E, GPM	3.3	0.16	JAXA ➔ GSFC-EBnet	2.4	n/a		n/a	n/a
GSFC ➔ JSpace	ASTER	16.4	6.8	GSFC-EDOS ➔ JSpace-ERSD	2.96	209.2	209.2	Excellent	Ex
JSpace ➔ EROS	ASTER	8.3	8.3	JSpace-ERSD ➔ EROS PTH	3.6	322.2	322.2	Excellent	Ex
GSFC ➔ KNMI	OMI	13.4	13.4	GSFC-OMISIPS ➔ KNMI ODPS	1.80	51.7	51.7	Excellent	Ex

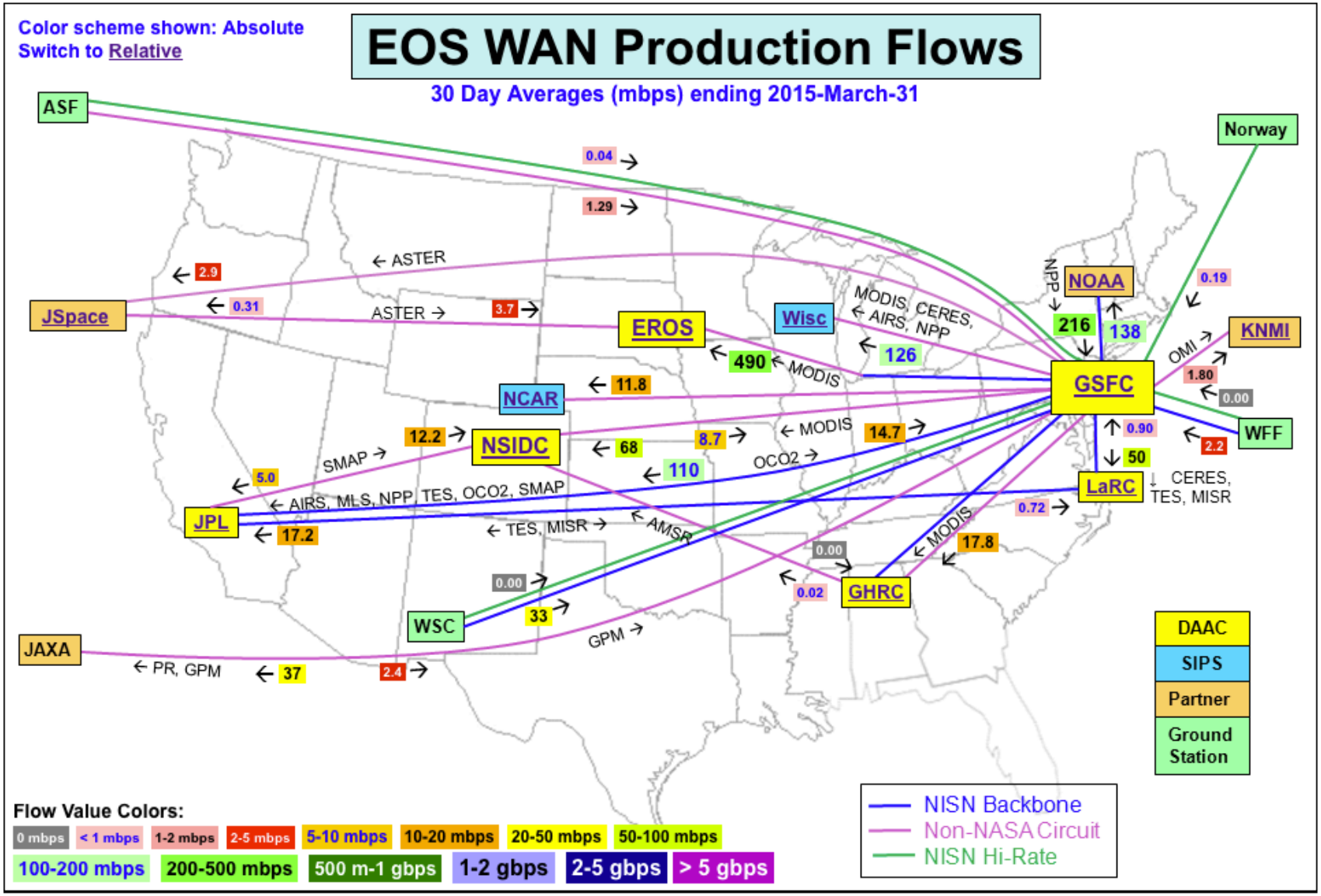
Significant change from FY '12 to FY '14

Changed in 2014 | Value used for ratings

*Criteria:		
	Excellent	**Total Kbps** > Requirement * 3
	Good	1.3 * Requirement <= **Total Kbps** < Requirement * 3
	Adequate	Requirement < **Total Kbps** < Requirement * 1.3
	Almost Adequate	Requirement / 1.5 < **Total Kbps** < Requirement
	Low	Requirement / 3 < **Total Kbps** < Requirement / 1.5
	Bad	**Total Kbps** < Requirement / 3

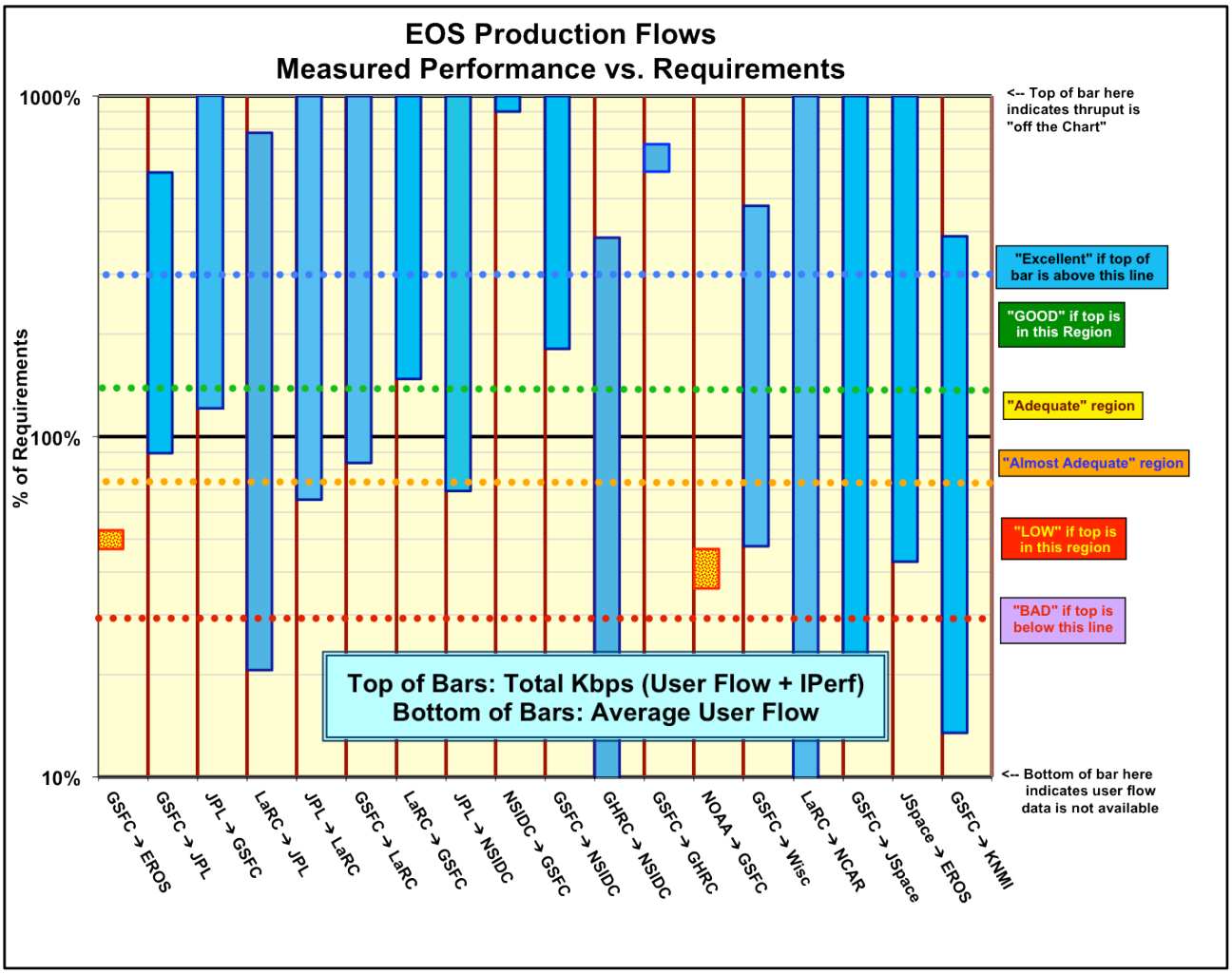
Ratings Summary	FY '15 Req Score	FY '15 Req Prev
Excellent	16	16
Good	0	0
Adequate	0	0
Almost Adequate	0	1
Low	2	1
Bad	0	0
Total Sites	18	18
GPA	3.67	3.69

Notes: Flow Requirements include:
TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS, NPP, GPM, SMAP, OCO2



This chart shows the averages for the main EOS production flows for the current month. **Closed side flows were again not available this month.** Up to date flow information can be found at http://ensight.eos.nasa.gov/Weather/web/hourly/Production_Flows-A.shtml

This graph shows a bar for each source-destination pair – relating the measurements to the requirements for that pair. The bottom of each bar represents the average measured user flow from the source site to the destination site (as a percent of the requirement) – it indicates the relationship between the requirements and actual flows. Note that the requirements generally include a 50% contingency factor above what was specified by the projects, so a value of 67% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar similarly represents the integrated measurement, combining the user flow with Iperf measurements – this value (when available) is used to determine the ratings.



1) EROS:

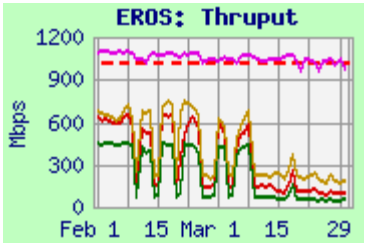
Ratings: GSFC → EROS: ↓ **Almost Adequate** → **Low**
JSpace → EROS: Continued **Excellent**

1.1 GSFC → EROS:

Web Pages: http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

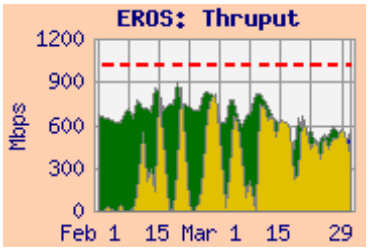
Test Results:

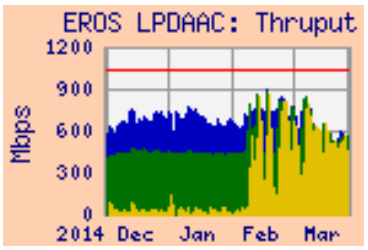
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODAPS-PDR→ EROS LPDAAC	506.5	220.8	160.8	475.1	593.0
GSFC-EDOS → EROS LPDAAC	229.9	64.3	42.5		
GES DISC → EROS LPDAAC	310.5	125.3	92.8		
GSFC-ENPL → EROS LPDAAC	1075.0	1041.5	771.0		
GSFC-ENPL → EROS PTH	2014.1	1659.3	1083.4		
GSFC-EDOS → EROS PTH	80.0	11.8	3.8		
GSFC-NISN-PTH → EROS PTH	662.4	289.3	55.0		
ESDIS-PS → EROS PTH	204.6	45.5	22.6		



Requirements:

Source → Dest	Date	Mbps	prev	Rating
GSFC → EROS	8/14	1016.1	49.8	Low





Comments: The rating is based on the **MODAPS-PDR** Server to EROS LP DAAC measurement, since that is the primary flow.

The reprocessing flow requirement began in August, so the requirement increased to 1016.1 mbps at that time (was only 49.8 mbps previously). **Note from the integrated graph that the reprocessing flow began in February** -- the peaks were close to 90% of the requirement (including reprocessing). The user flow this month averaged 593 mbps – much higher than the 24 mbps before reprocessing began.

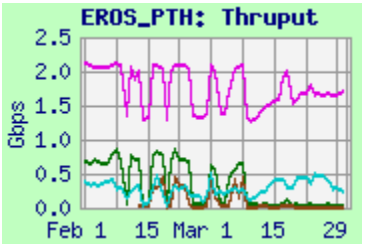
The integrated thruput from all sources was mostly stable this month, while **the iperf tests were much lower during peak MODIS flows.** The median integrated thruput from **MODAPS-PDR** to LPDAAC decreased, and dropped below 2/3 of the new requirement (which includes reprocessing), so the rating drops to **Low**. However, this is probably an artifact of the calculation method applied to the large MODIS flow.

The median thruput from **GSFC-EDOS** and **GES DISC** (also on EBnet) dropped similarly to MODAPS.

The route from EBnet sources is via the Doors, to NISN SIP on the NISN 10 gbps backbone, to the NISN Chicago CIEF, then via a NISN GigE, peering at the StarLight Gigapop with the EROS OC-48 (2.5 gbps) tail circuit.

Iperf testing for comparison is performed from **GSFC-ENPL** to LPDAAC (the "FTL" node, a 10 gig host outside the EROS firewall). The route is via a direct 10 gig connection to the MAX, to the Internet2 100 gbps backbone, to StarLight in Chicago, then via the EROS OC-48 tail circuit. **Thruput from GSFC-ENPL to LPDAAC is much steadier than from EBnet sources, and is not much affected by the MODAPS reprocessing flow.**

1) EROS: (continued)



Iperf testing is also performed from **GSFC-ENPL, GSFC-NISN-PTH, GSFC-EDOS,** and **ESDIS-PS** to the EROS-PTH (10 gig test host). **GSFC-ENPL** (IPv4) to EROS-PTH now typically gets about 2 gbps -- somewhat affected by the MODIS reprocessing. This shows that the capacity of the EROS connection to StarLight is well in excess of the requirement (including reprocessing) – it would be rated **Good**. EROS has not been configured for IPv6 since February 2014.

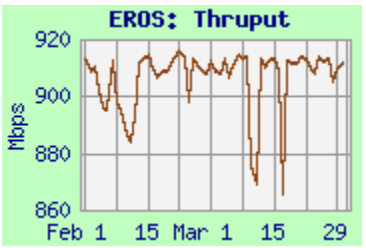
The combined results show that all EBnet sources have poor iperf performance to both EROS and EROS-PTH during high MODIS reprocessing flows. But **GSFC-NISN-PTH**, which uses the same NISN SIP to StarLight route, was not affected as much. **This indicates that the congestion is at GSFC, between EBnet and NISN SIP.**

Additional Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
JSpace-ERSD → EROS PTH	327.3	322.2	303.0	3.57	322.2
NSIDC SIDADS→ EROS PTH	915.0	911.9	856.1		
LaRC PTH→ EROS PTH	186.5	185.7	83.4		

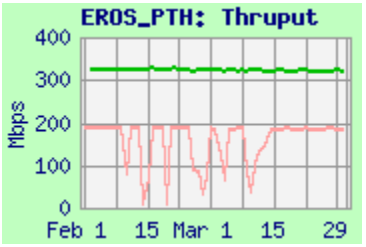
Requirements:

Source → Dest	Date	mbps	prev	Rating
JSpace → EROS	FY '06 –	8.3	8.3	Excellent



1.2 JSpace-ERSD → EROS: **Excellent**. See section 9 (ERSD) for further discussion.

1.3 NSIDC → EROS-PTH: Performance was stable and excellent this month. (Note the expanded scale on the graph).



1.4 LaRC → EROS-PTH: The route from LaRC-PTH is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources. Performance was somewhat affected by the large MODIS reprocessing flows. Note that LaRC-PTH has a 200 mbps outflow limitation.

2) to GSFC
2.1) to NPP, GES DISC, etc.

Ratings: JPL → GSFC: Continued **Excellent**
NSIDC → GES DISC: Continued **Excellent**
LDAAC → GES DISC: Continued **Excellent**
NOAA → NPP SD3E: Continued **Low**

Web Pages:

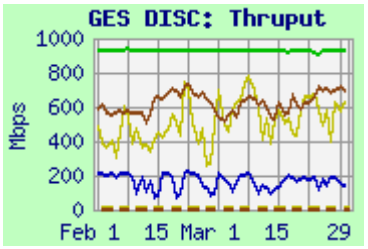
http://ensight.eos.nasa.gov/Missions/NPP/GSFC_SD3E.shtml
http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml
http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtml
http://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml

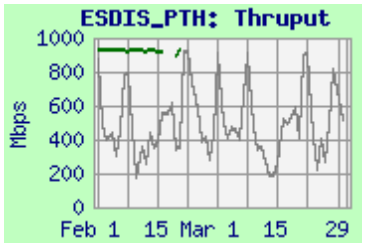
Test Results:

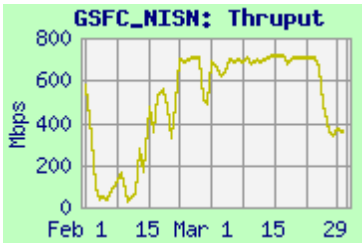
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
EROS LPDAAC → GES DISC	214.5	172.2	83.6		
EROS PTH → GSFC-ESDIS PTH	904.0	465.5	148.0		
JPL-PODAAC → GES DISC	835.1	573.2	188.1	14.5	
JPL-NISN-PTH → GSFC-NISN	716.0	691.7	207.4		
NSIDC DAAC → GES DISC	744.1	627.8	466.6	6.3	
NSIDC DAAC → GSFC-ISIPS (scp)	32.1	31.3	24.3		
LaRC ASDC → GES DISC	936.2	934.3	777.8	0.89	
LARC-ANGe → GSFC-ESDIS PTH	n/a	n/a	n/a		
NOAA-PTH → NPP-SD3E-OPS1	229.2	221.5	213.8	215.3	280.9

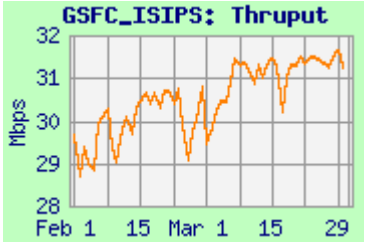
Requirements:

Source → Dest	Date	FY '15	FY '12	Rating
JPL→ GSFC combined	FY '15 –	11.9	0.57	Excellent
NSIDC → GSFC	FY '15 –	0.009	0.017	Excellent
LaRC ASDC → GES DISC	CY '12 –	0.6	0.6	Excellent
NOAA → NPP SD3E	FY '15 –	601.3	522.3	Low









Comments:

2.1.1 EROS LPDAAC, EROS-PTH → GSFC: The thruput for tests from **EROS LPDAAC** to GES DISC and from **EROS-PTH** to ESDIS-PTH were again noisy, with the PTH's getting better results than the DAACs.

2.1.2 JPL → GSFC: Thruput from **JPL-PODAAC** to GES DISC remains noisy. **Note that JPL campus nodes → EBnet flows take Internet2 instead of NISN, based on JPL routing policies.** Thruput was well above 3 x the requirement, so the rating remains **Excellent**. The 14.5 mbps average user flow was above the requirement and the 13.4 mbps last month. Testing from **JPL-NISN-PTH** to GSFC-NISN is routed via NISN PIP, and is also noisy.

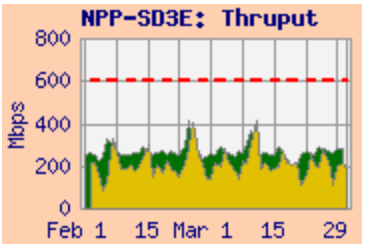
2.1.3 NSIDC → GSFC: Performance from **NSIDC** to GES DISC remained way above the tiny requirement, so the rating remains **Excellent.** The user flow was again well above both the old and lower new requirement.

Thruput to **GSFC-ISIPS** using SCP remains well above the requirement.

2.1.4 LaRC → GSFC: Performance from both **LaRC ASDC** to GES DISC and **LaRC ANGe** to ESDIS-PTH was very stable this month. Both results remained way above 3 x the modest requirement, so the rating continues as **Excellent**. The user flow this month was very close to the requirement.

2.1) to NPP, GES DISC continued.

2.1.5 NOAA → NPP-SD3E: Performance from **NOAA-PTH** to GSFC NPP-SD3E-OPS1 dropped dramatically in early November. The user flow was close to usual, at about 40% of the requirement (with contingency), and appeared unaffected, leading to the inference that the problem was with the test node at NOAA, not the network. Investigation continues.

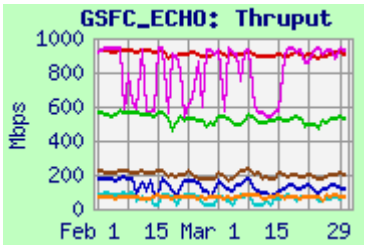


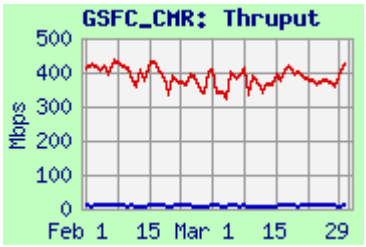
2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_ECHO.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
EROS LPDAAC	167.9	120.3	69.4
EROS LPDAAC ftp	104.3	60.1	12.8
GES DISC	934.6	901.8	850.5
GES DISC ftp	946.7	909.2	486.3
LaRC ASDC DAAC	565.4	518.6	418.2
NSIDC DAAC	235.2	195.9	132.4
NSIDC DAAC ftp	105.3	67.6	31.7
EROS LPDAAC → CMR	9.6	9.2	8.1
GES DISC → CMR	422.1	378.1	327.3





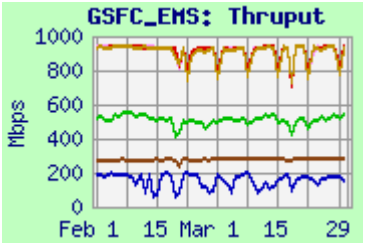
Comments: Performance was mostly stable from all sources. FTP performance is mostly limited by TCP window size – especially from sites with long RTT. Testing to the "Common Metadata Repository" (CMR), which will replace ECHO, was started in November. Performance is erratic – a new server software has been requested.

2.3 GSFC-EMS: EOS Metrics System

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_EMS.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
EROS LPDAAC	197.9	162.1	71.8
ESDIS-PTH	939.1	931.3	660.8
GES DISC	938.5	932.4	697.8
LARC ASDC	568.2	511.9	416.4
MODAPS-PDR	938.7	928.0	639.2
NSIDC-SIDADS	288.5	282.6	170.3



Comments: Iperf testing is performed to GSFC-EMS from the above nodes. Performance was mostly stable from all sources.

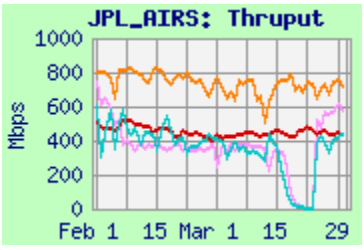
3) JPL:

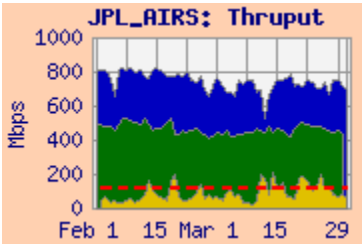
3.1) GSFC → JPL:

Ratings: GSFC → JPL: Continued **Excellent**

Test Results: (additional results on next 2 pages)

Source → Dest	Medians of daily tests (mbps)				
	Best	**Median**	**Worst**	**User Flow**	**Integrated**
NPP-SD3E-OPS1 → JPL-AIRS	822.8	714.8	341.7	108.0	722.5
GSFC-GES DISC → JPL-AIRS	502.9	437.5	307.4		
ESDIS-PTH → JPL-AIRS	412.2	359.6	267.7		
GSFC-NISN-PTH → JPL-AIRS	576.3	340.3	52.2		
NPP-SD3E-OPS1 → JPL-Sounder	840.0	732.4	357.4		
GSFC-NISN-PTH → JPL-Sounder	663.4	504.1	382.6		





Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → JPL Combined	FY '15	**121.0**	**63**	**Excellent**
GSFC → JPL AIRS	FY '15	11.4	40	**Excellent**
GSFC NPP → JPL Sounder	FY '15	15.9	15	**Excellent**

Comments: **3.1.1 Overall GSFC to JPL:**

Overall user flow increased this month – the 108 mbps average flow (for all EBnet to JPL flows) is close to the requirement, with contingency, and above the 76 mbps peak last month.

The overall rating is based on the **NPP-SD3E-OPS1** to JPL AIRS thruput, compared with the sum of all the GSFC to JPL requirements. The median thruput remained well above 3 x this requirement, so the overall rating remains **Excellent**.

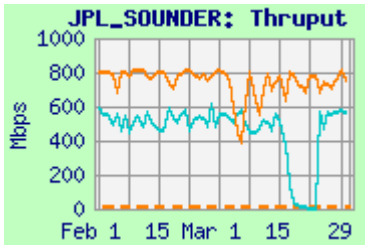
Most GSFC to JPL flows use the NISN PIP network, and are thus not affected by the NISN SIP congestion due to large MODIS reprocessing flows.

3.1.2 AIRS: http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml

The median integrated thruput from **NPP-SD3E-OPS1** to JPL-AIRS remains well above 3 x the AIRS requirement, so the AIRS rating remains **Excellent**. Performance from **GES DISC** was similar. **ESDIS-PTH** and **GSFC-NISN-PTH** suffered from what appears to be a repeat of the etherchannel problem at JPL – poor performance from specific sources to specific destinations – while the same sources work well to other destinations, and the same destinations work well from other sources. This problem began on March 15, gradually got worse, and cleared up on March 23. Note that **ESDIS-PTH**, **GES DISC**, and **NPP-SD3E-OPS1** are on EBnet, and connect through the Doors, while **GSFC-NISN** does not.

3.1.3 NPP to JPL Sounder: http://ensight.eos.nasa.gov/Missions/NPP/JPL_SOUNDER.shtml

Performance from **NPP-SD3E-OPS1** was stable. Thruput was well above the requirement, rating **Excellent**. From **GSFCNISNPTH**, performance was stable, except for the March 15-23 problem.



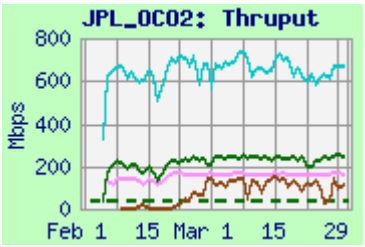
3.1) GSFC → JPL: continued

Test Results: continued

Source → Dest		Medians of daily tests (mbps) Best	Median	Worst	Requirement (mbps)	Rating
GSFC-EDOS B13 → JPL-OCO2	1 stream	251.7	240.3	101.4	36.6	Excellent
	6 streams	767.3	660.8	324.4		Excellent
GSFC-EDOS B32 → JPL-OCO2		231.2	118.3	4.4		
ESDIS-PTH → JPL-OCO2		168.2	162.3	38.4		
GSFC-EDOS B13 → JPL-SMAP	1 stream	382.7	377.8	245.7	49	↑ Excellent
	6 streams	481.1	311.9	107.7		
GSFC-EDOS B32 → JPL-SMAP		301.3	184.1	4.6		
ESDIS-PTH → JPL-SMAP		388.0	346.0	125.0		

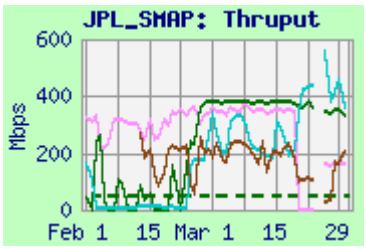
Testing from EDOS to both OCO2 and SMAP was added last month from an EDOS node in B32 – previous testing from EDOS was from B13. Initial results were very strange … testing to OCO2 from B32 was erratic, and much worse than from B13 (which was stable), while results to SMAP were opposite – thruput from B32 was stable and better than the erratic performance from B13! The problem was cleared up late in February when a bad ethernet was removed from an etherchannel at JPL. Performance to both OCO2 and SMAP were much more stable this month.

3.1.4 OCO2: http://ensight.eos.nasa.gov/Organizations/daac/JPL_OCO2.shtml



Testing from **EDOS-B13** to OCO2 is done using both a **single stream** and **6 streams**. Performance was stable since early December.. Median thruput from EDOS (using both single stream and 6 streams) is well above 3 x the requirement, so is rated **Excellent**. Testing was added in February from **ESDIS-PTH**, which was stable and similar to **EDOS-B13,** and from **EDOS-B32,** initially with erratic and poor performance until the JPL ethernet fix, above, was implemented.

3.1.5 SMAP: http://ensight.eos.nasa.gov/Organizations/daac/JPL_SMAP.shtml



Performance from **EDOS-B13 single stream** was erratic – sometimes thruput was good (300 mbps range), but frequently was less that 10 mbps, until the JPL ethernet fix, above, was implemented. For this month, the median **single stream** thruput was well above 3 x the requirement, improving the rating to **Excellent**.

6 stream testing from **EDOS-B13** did not improve on the single stream.

Testing was added in December from **ESDIS-PTH** , and in February from **EDOS-B32,** with mostly stable performance, initially at a higher average level that from EDOS-B13 – until the etherchannel fix improved performance from EDOS-B13.

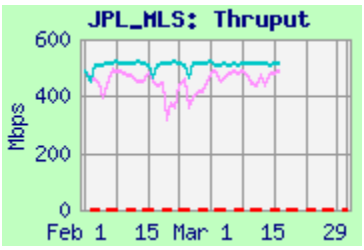
3.1) GSFC → JPL: continued

Test Results: continued

Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
ESDIS-PTH → JPL-MLS	501.7	479.2	378.4
GSFC-NISN-PTH → JPL-MLS	528.2	513.3	420.9
ESDIS-PTH → JPL-PODAAC	566.6	535.4	277.5
GSFC-NISN-PTH → JPL- PODAAC	780.2	656.4	185.4
ESDIS-PS → JPL-QSCAT	92.4	91.9	83.4
GSFC-NISN-PTH → JPL-QSCAT	74.3	74.0	71.0
ESDIS-PTH → JPL-NISN-PTH	77.5	25.7	9.9
EDOS-B32 → JPL-NISN-PTH	59.1	8.1	2.9

3.1.6 MLS:

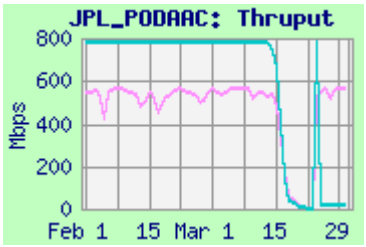
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml



Thruput from both ESDIS-PTH and GSFC-NISN stabilized in early December, and was way above the modest 1.2 mbps requirement, so the rating remains **Excellent**. The MLS test server at JPL was retired in mid-march – a replacement is planned.

3.1.7 PODAAC:

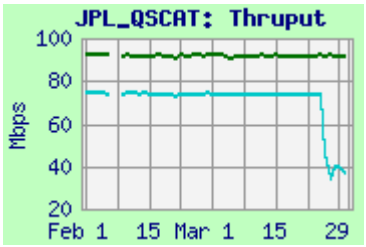
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml



There is no longer a requirement from GSFC to JPL PODAAC in the database. Performance stabilized in early December, but was apparently affected by the etherchannel problem March 15-23. Thruput was way above the previous 1.5 mbps PODAAC requirement.

3.1.8 QSCAT:

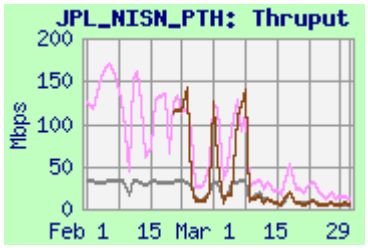
http://ensight.eos.nasa.gov/Organizations/daac/JPL_QSCAT.shtml



There is no longer a requirement from GSFC to JPL QSCAT in the database. Thruput from **ESDIS-PS** and **GSFC-NISN-PTH** to QSCAT also stabilized in early December, then dropped at the end of March. Thruput from both sources remained well above the modest previous 0.6 mbps requirement.

3.1.9 GSFC to JPL-NISN-PTH:

http://ensight.eos.nasa.gov/Organizations/daac/JPL_NISN_PTH.shtml



The JPL-NISN-PTH node is directly connected to the NISN SIP router at JPL, so flows from GSFC use the NISN SIP network. The thruput from ESDIS-PTH to JPL-NISN-PTH was stable until late February, when the MODIS reprocessing began, congesting the EBnet to NISN SIP connection, severely impacting performance.

Testing was added from **GSFC-EDOS** on February 20 – its performance was similar to ESDIS-PTH.

3.2) LaRC → JPL

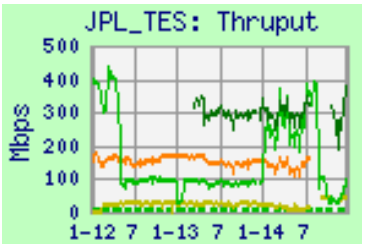
Rating: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtml
http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml

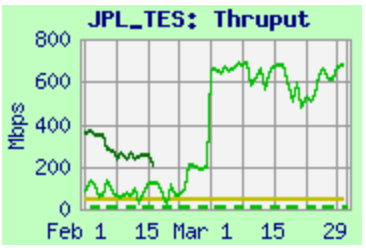
Test Results:

Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	User Flow
LaRC ANGE → JPL-TES	n/a	n/a	n/a	
LaRC ASDC → JPL-TES	682.0	651.4	412.3	17.2
LaRC ANGE → JPL-PTH	n/a	n/a	n/a	
LaRC PTH → JPL-PTH	181.7	145.1	79.6	

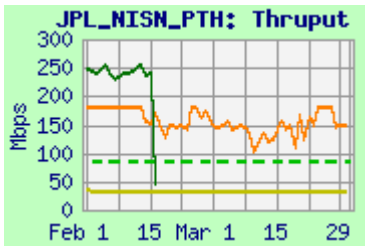


Requirements:

Source → Dest	Date	Mbps	Prev	Rating
LaRC → JPL-Combined	CY '12 –	83.5	69.3	Excellent
LaRC ASDC → JPL-TES	CY '12 –	5.5	7.0	Excellent



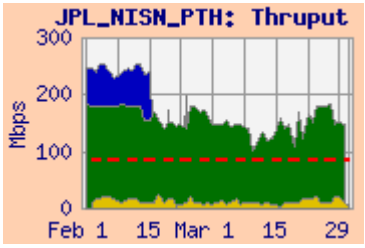
3.2.1 LaRC→ JPL (Overall, TES): Performance from LaRC ASDC to JPL-TES recovered in late February (and was retuned with further improvement in March), with the JPL Ethernet fix. Performance had dropped dramatically in mid August 2014, when the JPL Ethernet problem apparently began. LaRC ASDC to JPL-TES had improved dramatically in early January 2014 with the ASDC node upgrade!



The LaRC to JPL Overall rating is now based on the results from LaRC ASDC to JPL-TES, since the LaRC ANGe test node went down in mid February. The median improved thruput was much more than 3 x the combined requirements, so the overall rating remains **Excellent**. Total LaRC to JPL user flow is about 31% of the requirement (without contingency).

The TES rating also remains **Excellent**. User flow to TES is very low.

3.2.2 LaRC→ JPL-NISN-PTH: Performance from LaRC-PTH to JPL-NISN-PTH stabilized a bit below its 200 mbps limitation JPL-NISN-PTH is directly connected to the NISN router at JPL, so it was not affected by the congestion between NISN and the JPL campus (or the JPL ethernet problem). The LaRC ANGe node was down, so no testing occurred.



3.2) LaRC → JPL (continued)

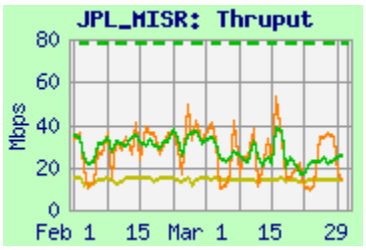
3.2.3 LaRC → JPL-MISR: http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml

Test Results:

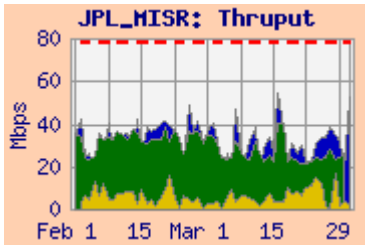
Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	User Flow
LaRC ASDC → JPL-MISR	39.1	24.3	2.3	
LaRC PTH → JPL-MISR	58.8	22.1	0.8	6.3
JPL-NISN-PTH → JPL-MISR	15.4	14.2	1.0	

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
LaRC ASDC → JPL-MISR	CY '12 –	78.1	62.3	Bad



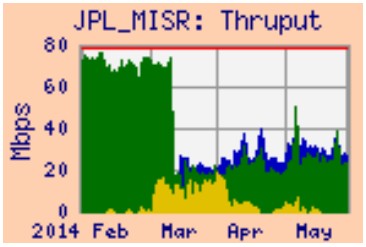
Performance from LaRC ASDC to JPL-MISR is similar to that from LaRC PTH, limited by the Fast-E connection to the MISR node. Thruput to MISR from both sources dropped severely in March 2014, after improving in December 2013.

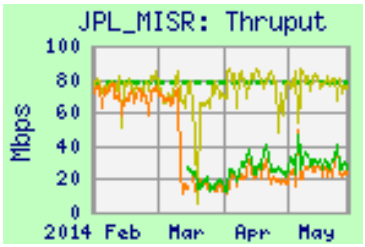


This month, the median integrated thruput from LaRC ASDC dropped to a bit below 1/3 the MISR requirement, so the MISR rating drops to **Bad**. User flow was a bit higher than last month, but averaged only about 12% of the requirement, without contingency.

Note that there was a user flow peak, beginning in late February 2014, BEFORE the measured thruput dropped in March, suggesting that the user flow is not the cause of the thruput drop.

Performance to JPL-MISR is even poor from JPL-NISN-PTH, suggesting that the problem is unique to MISR, and not a WAN issue. So the LaRC → JPL Overall rating is not based on this result, however, since it not indicative of the capability of the network.





4) LaRC

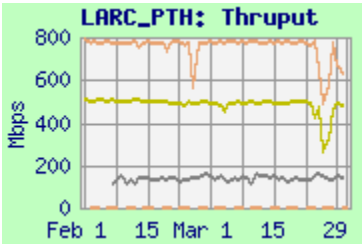
4.1) JPL → LaRC

Rating: Continued **Excellent**

Web Page: http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

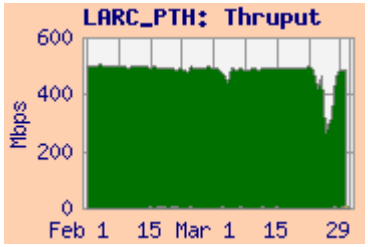
Source → Dest	Medians of daily tests (mbps)			
	Best	Median	Worst	User Flow
JPL-NISN-PTH → LaRC PTH	932.3	791.8	690.0	0.72
JPL-TES → LaRC PTH	795.5	775.5	219.1	
JPL-PS → LaRC PTH	221.0	143.0	94.8	



Requirements:

Source → Dest	Date	Mbps	Prev	Rating
JPL → LaRC	CY '12 –	1.1	1.5	**Excellent**

Comment: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. The route from JPL to LaRC is via NISN PIP. This month, performance from JPL-TES to LaRC-PTH was stable. Note that ARC to JPL flows were diverted off NISN in December 2014. The thruput remained much higher than the requirement; the rating remains **Excellent**.



Thruput from JPL-NISN-PTH to LaRC-PTH increased at the beginning of June 2014, when JPL-NISN-PTH was connected to a Gig-E port on a NISN switch – previously it was limited to 100 mbps due to its connection to a Fast-E port. The thruput was stable this month, as JPL-NISN-PTH is not subject to NISN to JPL campus congestion.

Thruput from both JPL sources to LaRC-PTH increased again in September 2014, when LaRC-PTH was upgraded.

An additional test was added in February to LaRC-PTH from a new JPL node, JPL-PerfSonar (JPL-PS). Thruput was lower than the other nodes – will be investigated.

The JPL to LaRC integrated graph doesn't really show the 0.72 mbps user flow from JPL to LaRC this month. This is the entire NISN flow from JPL to LaRC – it may not all be EOS related. But it is consistent with the EOS requirement.

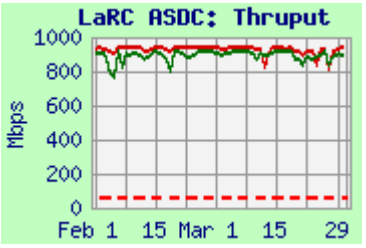
4.2) GSFC → LaRC:

Rating: Continued **Excellent**

Web Pages : http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

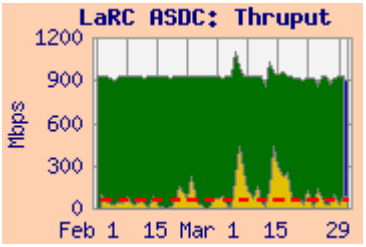
Test Results:

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GES DISC → LaRC ASDC	936.4	929.3	734.6	50.8	930.4
GSFC-EDOS → LaRC ASDC	927.2	901.9	587.3		
ESDIS-PTH → LaRC-ANGe	n/a	n/a	n/a		
GSFC-NISN-PTH → LaRC-ANGe	n/a	n/a	n/a		
GES DISC → LaRC-PTH	559.9	267.5	215.9		
GSFC-NISN-PTH → LaRC-PTH	932.3	791.8	690.0		
NPP-SD3E → LaRC-PTH	481.6	240.2	194.1		



Requirements:

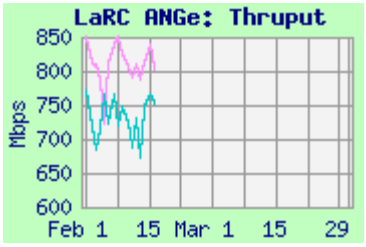
Source → Dest	Date	Mbps	Prev	Rating
GSFC → LARC (Combined)	CY '12 –	60.7	52.2	Excellent



Comments:

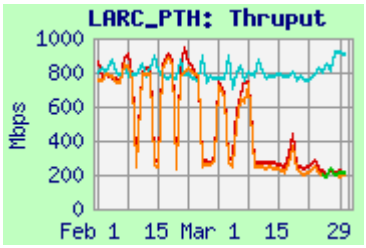
GSFC → LaRC ASDC: Thruput from **GES DISC** to LaRC ASDC DAAC remained well above 3 x the increased combined requirement, close to the circuit limitation, so the rating remains **Excellent**. Thruput to ASDC from **GSFC-EDOS** was slightly lower and noisier. The lack of degradation during large MODIS reprocessing flow indicates that this flow is on NISN's PIP network, not SIP

As seen on the integrated graph, the 51 mbps average user flow this month was above typical and the requirement (without contingency), with occasional large peaks.



GSFC → ANGe (LaTIS): Testing to ANGe ("Bob") from both ESDIS-PTH and GSFC-NISN-PTH was stable, close to the circuit limitation, until "Bob" went down in mid February. (Note the expanded scale on the graph).

GSFC → LaRC-PTH: Testing to LaRC-PTH from EBnet sources (**GES DISC**, **NPP-SD3E**) became quite noisy in late February, when the MODIS reprocessing began, congesting the EBnet to NISN SIP connection. Performance from GSFC-NISN-PTH, outside of EBNet, was stable.



Performance from all sources had improved from all sources in late September 2014, when the LaRC-PTH node was upgraded.

5) Boulder CO sites:

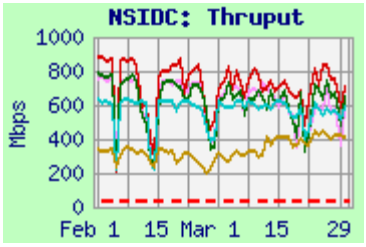
5.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**
GHRC → NSIDC: Continued **Excellent**
JPL → NSIDC: Continued **Excellent**

Web Pages: http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml

Test Results: NSIDC S4PA

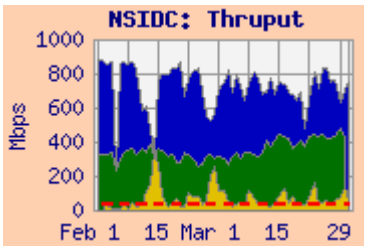
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
MODAPS-PDR → NSIDC DAAC	521.6	371.1	238.4	69.7	407.5
GES-DISC → NSIDC DAAC	899.8	717.7	364.5		
GSFC-EDOS → NSIDC DAAC	820.7	640.3	249.5		
ESDIS-PTH → NSIDC DAAC	775.1	597.8	316.0		
GSFC-ISIPS → NSIDC (iperf)	629.4	583.6	309.5		
JPL SMAP → NSIDC DAAC	805.0	622.0	280.0	11.8	
JPL PS → NSIDC DAAC	814.0	574.5	225.0		
GHRC → NSIDC DAAC (nuttcp)	20.9	19.7	12.4	0.024	
GHRC → NSIDC DAAC (ftp pull)	37.1	33.2	14.0		



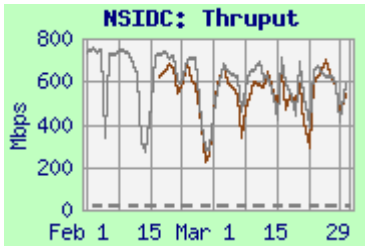
Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → NSIDC	8/14 –	38.5	16.8	**Excellent**
JPL → NSIDC	FY '15 –	17.1	0.16	**Excellent**
GHRC → NSIDC	FY '15 –	5.14	2.08	**Excellent**

Comments: The requirements were updated in June 2014 to use the FY '14 database, and include MODIS reprocessing, which has now begun. AMSR-E flows from EDOS and JPL have been removed.



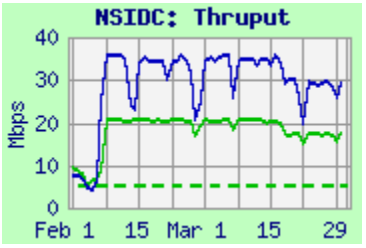
5.1.1 GSFC → NSIDC S4PA: The rating is based on testing from the **MODAPS-PDR** server to the NSIDC DAAC, since that is the primary flow. The median thruput from **MODAPS-PDR** dropped slightly, probably due to large reprocessing flow to EROS. But it remained well above 3 x the increased requirement, so the rating remains **Excellent**. The 70 mbps average user flow is apparently due to the MODIS reprocessing flow, and is now almost 2 x the requirement. Performance from **GES-DISC**, **GSFC-EDOS**, and **GSFC-ISIPS** was a little higher and mostly stable.



5.1.2 JPL SMAP → NSIDC S4PA: There is no longer a JPL to NSIDC requirement for AMSR-E. A new 17.1 mbps flow requirement for SMAP began in October, before the SMAP launch on January 31.

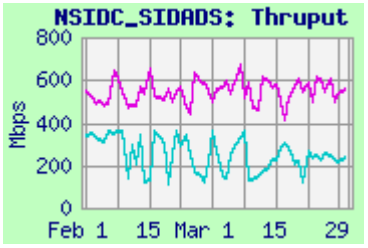
Testing to NSIDC from **JPL-SMAP** was well in excess of the SMAP requirement, rating **Excellent**. Thruput stabilized in December, like many other JPL flows. A new test was added in February from a new test node at JPL – **JPL-PerfSonar (JPL-PS).** Performance was similar to **JPL-SMAP**. The user flow increased to 12 mbps – close to the requirement without contingency, and was more than the 0.93 mbps last month, before science operations started.

5) Boulder CO sites (Continued):



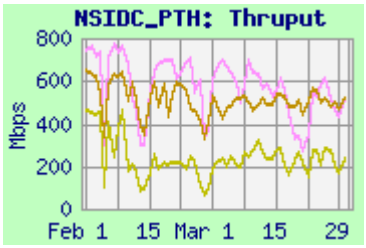
5.1.3 **GHRC, GHRC-ftp → NSIDC S4PA:** GHRC (NSSTC, UAH, Huntsville, AL) sends reprocessed AMSR-E data to NSIDC via Internet2. This requirement increased to 5.14 mbps in December '14 (was 2.08 mbps previously) – when the next reprocessing campaign began.

The median integrated thruput stabilized and improved in early February – it remained above the increased requirement by more than 3 x, so the rating remains **Excellent**



Test Results: NSIDC-SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
GSFC-ENPL → NSIDC-SIDADS	727.0	560.0	364.0
GSFC-NISN → NSIDC-SIDADS	338.1	254.9	148.3
ESDIS-PTH → NSIDC-PTH	763.3	559.0	274.0
MODAPS-PDR → NSIDC-PTH	664.0	502.4	327.6
JPL-NISN-PTH → NSIDC-PTH	440.2	232.2	60.4



5.1.4 GSFC → NSIDC-SIDADS: Performance from GSFC-ENPL was retuned in June '14 (using 30 streams, to compensate for the small window size on SIDADS) with increased thruput. Testing from GSFC-NISN was similarly retuned in September.

5.1.5 NSIDC-PTH: Thruput from all sources to NSIDC-PTH improved in mid December 2014, when the NSIDC-PTH machine was upgraded.

5) Boulder CO sites (Continued):

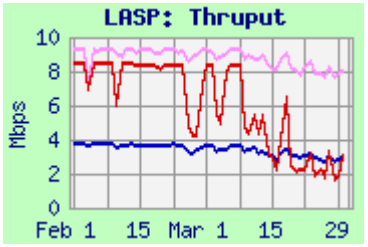
5.2) LASP:

Rating: LASP → GSFC: Continued **Excellent**

Web Page: http://ensight.eos.nasa.gov/Organizations/production/LASP.shtml

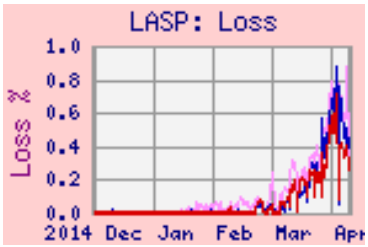
Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (scp)	3.62	3.16	2.61
ESDIS-PTH → LASP blue (iperf)	9.34	8.62	7.10
GES DISC → LASP blue (iperf)	7.70	3.33	1.07
LASP → GES DISC	9.23	9.01	8.54



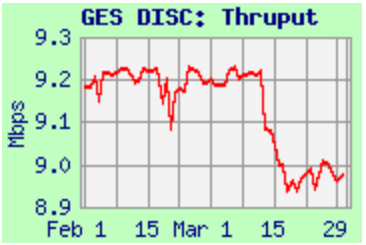
Requirement:

Source → Dest	Date	Mbps	Rating
LASP → GES DISC	CY '10 -	0.016	Excellent



Comments: In January '11, LASP's connection to NISN PIP was rerouted to a 10 mbps connection to the NISN POP in Denver; previously it was 100 mbps from CU-ITS via NSIDC.

In early February, packet loss from EBnet to LASP began increasing, peaking at almost 1% in late March, probably due to congestion from the large MODIS reprocessing flows. Performance dropped from all sources, especially from **GES DISC.**

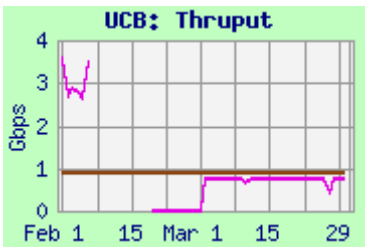


Return testing from **LASP** to GES DISC was also affected by the congestion, but not very much. Thruput was close to the circuit limitation, and much higher than 3 x the requirement, rating **Excellent**.

5.3) UCB: http://ensight.eos.nasa.gov/Organizations/daac/UCB.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL	762.2	753.0	496.9
GSFC-ESTO	910.0	910.0	874.0



Comments: Thruput from both **GSFC-ENPL** and **GSFC-ESTO** improved in early October '14, by switching back to the 10 gig connected test node at UCB (it had began failing consistently in mid-May 2013, so testing had been switched to a 1 gig test node in mid-June '13).

Testing from **GSFC-ENPL** began failing again in February, and was switched back to the 1 gig server in March. The route is via Internet2 to FRGP, similar to NCAR.

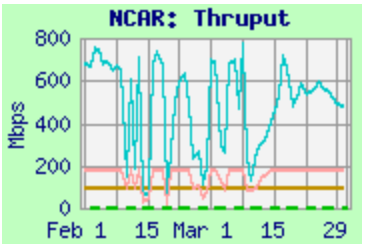
5.4) NCAR:

Ratings: LaRC → NCAR: Continued **Excellent**
GSFC → NCAR: Continued **Excellent**

Web Pages http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml

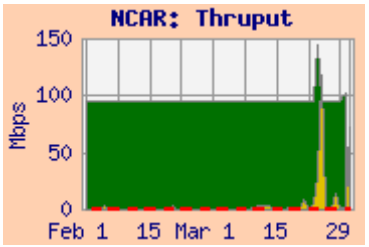
Test Results:

Source	Medians of daily tests (mbps)		
	Best	**Median**	**Worst**
LaRC PTH	181.1	177.7	103.6
GSFC-ENPL-10G	4462.7	2286.3	776.3
GSFC-ENPL-FE	96.3	96.0	95.5
GSFC-NISN-PTH	753.1	519.9	239.6

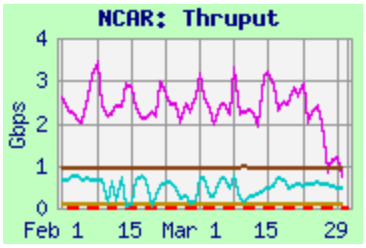


Requirement:

Source	Date	Mbps	Prev	Rating
LaRC	CY '12 -	0.044	0.1	**Excellent**
GSFC	CY '12 -	0.111	5.0	**Excellent**



Comments: NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements. Testing is to NCAR's 10 gigabit capable PerfSonar node since March '12.



5.4.1 From LaRC: Thruput from LaRC-PTH was very steady, and improved a bit with the LaRC-PTH upgrade in September '14. It remains limited to 200 mbps by agreement with CSO / NISN. The median remained well above 3 x the tiny requirement, so the rating remains **Excellent**.

5.4.2 From GSFC: From GSFC-NISN-PTH, the route is via NISN to the MAX (similar route as from LaRC-PTH). Thruput was noisy this month, but a bit less so than last month. The median was well above 3 x the tiny requirement, so the rating remains **Excellent**. The user flow from GSFC-EBnet averaged about 10.8 mbps this month (mostly in a huge burst over 100 mbps), and was well above the 0.6 mbps last month, and the revised and previous requirements.

From GSFC-ENPL-10G, with a 10 Gig-E interface, and a 10 gig connection to MAX, performance to NCAR's 10 Gig PerfSonar node is also noisy, but averages over 2 gbps, and gets over 4 gbps on peaks.

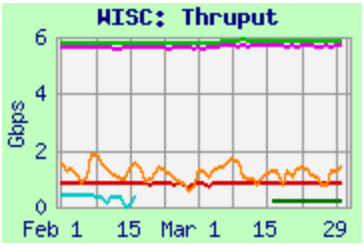
6) Wisconsin:

Rating: Continued **Excellent**

Web Pages http://ensight.eos.nasa.gov/Missions/NPP/WISC.shtml

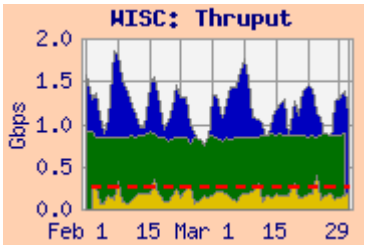
Test Results:

Source Node	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
NPP-SD3E	1995.9	1257.3	5.8	125.8	1257.3
GES DISC	860.5	854.2	776.7		
GSFC ENPL	5747.5	5685.9	5603.3		
GSFC-ENPL-v6	5913.6	5884.0	5752.8		
LaRC PTH	189.1	188.6	135.0		



Requirements:

Source Node	Date	mbps	Prev	Rating
NPP-SD3E	FY'14 -	242.3	237.2	Excellent
GSFC MODAPS	FY'14 -	21.9	16.5	Excellent
GSFC Combined	FY'14 -	264.2	253.7	Excellent
LaRC Combined	CY'12 -	n/a	7.9	n/a



Comments: The University of Wisconsin is included in this Production report due to its function as Atmosphere PEATE for NPP. Wisconsin continues to act as an SCF on the MODIS, CERES and AIRS teams.

6.1 GSFC: Testing from **NPP-SD3E** was switched to Wisconsin's 10 gig server in May 2013. Performance averages over 1 gbps. The median integrated thruput from **NPP-SD3E** remained above the NPP requirement by more than 3 x, so the NPP rating remains **Excellent**. It was also above the GSFC combined requirement by more than 3 x, so the combined rating also remains **Excellent**.

User flow was consistent with the requirement, similar to last month.

The route from EBnet at GSFC is via MAX to Internet2, peering with MREN in Chicago.

Testing from **GSFC-ENPL** was switched to the 10 gig server at Wisconsin (SSEC) in March 2013. Due to problems, testing was switched to a backup server in September '14, with reduced results, back to the 10 gig server in early October, to the backup server again in December, and back to the primary in January.

Testing from **GSFC-ENPL** using IPv6 was added in late November '14. Its performance was very stable and slightly better than IPv4 performance. Both IPv4 and IPv6 thruput averaged over 5 gbps.

Testing from **GES DISC** began failing in November, and was restored in January. Thruput was stable and close to the 1 gbps circuit limit.

6.2 LaRC: There is no longer a CERES requirement from LaRC to Wisconsin. In April 2013, testing from **LaRC ANGe** was switched to the new SSEC 10 gig server; performance improved at that time. The **LaRC ANGe** node went down in February; testing from **LaRC-PTH** was substituted.

Thruput from **LaRCPTH** was stable, and consistent with its 200 mbps outflow limitation. It remains well above the previous 7.9 mbps requirement; it would be rated **Excellent**. The route from LaRC is via NISN SIP, peering with MREN in Chicago.

7) KNMI:

Rating: Continued **Excellent**

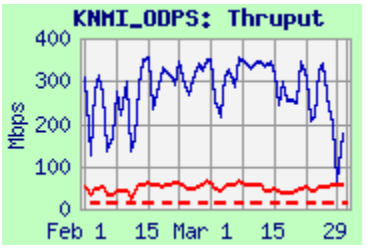
Web Page http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml

Test Results:

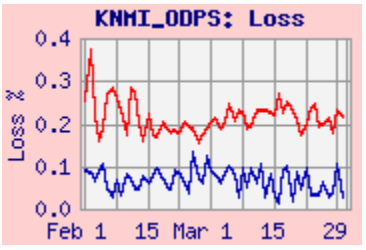
Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
OMISIPS → KNMI-ODPS	76.8	51.7	34.3	1.8	51.7
GSFC-ENPL → KNMI-ODPS	355.0	308.0	77.1		

Requirements:

Source Node	Date	mbps	Prev	Rating
OMISIPS	CY'12 -	13.4	0.03	Excellent

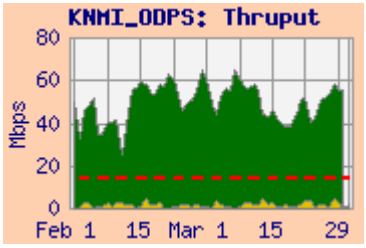


Comments: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant's 2+ x 10 gbps circuit to Frankfurt, then via Surfnet through Amsterdam.



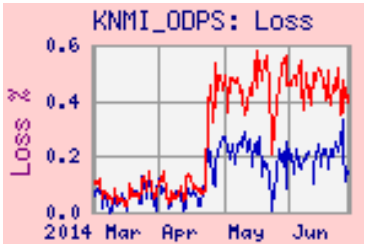
The requirement was increased with the use of the FY'14 database to 13.4 mbps, a much more realistic value than the previous 0.03 mbps.

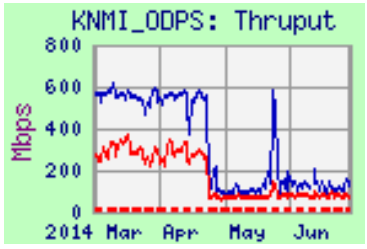
The rating is based on the results from **OMISIPS** on EBnet at GSFC to the ODPS primary server at KNMI. Thruput from both sources was stable until near the end of April 2014, when it dropped significantly, due to increased packet loss. **Thruput from GSFC-ENPL improved dramatically in mid-January** – with no apparent change in packet loss, or change in performance from **OMISIPS.**

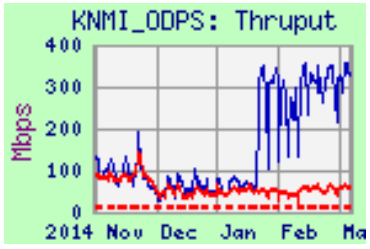


The median thruput from **OMISIPS** remains above 3 x the increased requirement, so the rating remains **Excellent**.

The user flow, however, averaged only 1.8 mbps this month, similar to recent months, but only 20% of the revised requirement (without contingency).







8) JSpace - ERSD:

Ratings: **GSFC → ERSD:** Continued **Excellent**
ERSD → EROS: Continued **Excellent**
ERSD → JPL-ASTER-IST: N/A

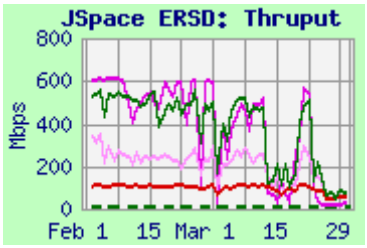
Web Page: http://ensight.eos.nasa.gov/Organizations/production/ERSDAC.shtml

US ←→ JSpace - ERSD Test Results

Source → Dest	Medians of daily tests (mbps)				
	Best	Median	Worst	User Flow	Integrated
GSFC-EDOS → JSpace-ERSD	587.7	209.2	30.3	2.96	209.2
GES DISC → JSpace-ERSD	116.1	96.2	24.3		
GSFC ESDIS-PTH → JSpace-ERSD	408.7	151.0	23.9		
GSFC ENPL (GE) → JSpace-ERSD	605.0	136.0	8.5		
JSpace-ERSD → EROS-PTH	327.3	322.2	303.0	3.57	322.2
JSpace-ERSD → JPL-PerfSonar	96.2	91.1	41.5		

Requirements:

Source → Dest	CY	Mbps	Prev	Rating
GSFC → JSpace-ERSD	'14 -	16.4	6.75	Excellent
JSpace-ERSD → JPL-ASTER IST	'12 -	0.31	0.31	Excellent
JSpace-ERSD → EROS	'12 -	8.33	8.3	Excellent



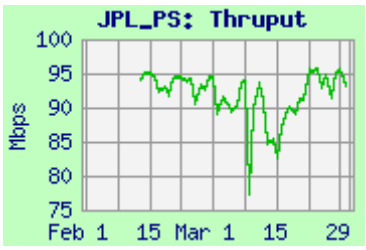
Comments:

8.1 GSFC → JSpace-ERSD: The old server at JSpace-ERSD was retired in early January. Testing to the new server was initiated in January, and February.

Performance to the new server at ERSD from all sources had good periods and bad periods. But median thruput **GSFC-EDOS** was well above the requirement, rating **Excellent**.

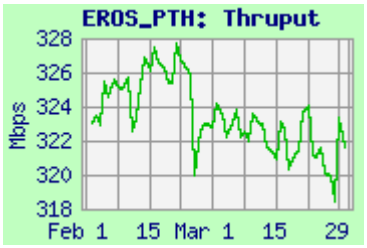
The 2.96 mbps user flow from GSFC to JSpace-ERSD was below the 4.56 mbps last month, and below the increased requirement, without contingency.

8.2 JSpace-ERSD → JPL-ASTER-IST: The JPL-ASTER-IST test node was retired in October 2012. JPL no longer uses a distinct IST; instead, JPL personnel log in directly to the IST at JSpace-ERSD. As a substitute, testing was initiated from ERSD to a different node at JPL ("JPL-PerfSonar"). Results to JPL-PS were very stable this month; the rating would be **Excellent .**



8.3 JSpace-ERSD → EROS: Thruput was very stable and remains well above the requirement, so the rating remains **Excellent**. The 3.6 mbps user flow this month was below last month's 5.2 mbps, and below the requirement, without contingency.

Testing from the new server at **JSpace** was initiated to EROS-PTH in October. Performance was retuned in January, and stabilized higher than previously -- it is rated **Excellent**.



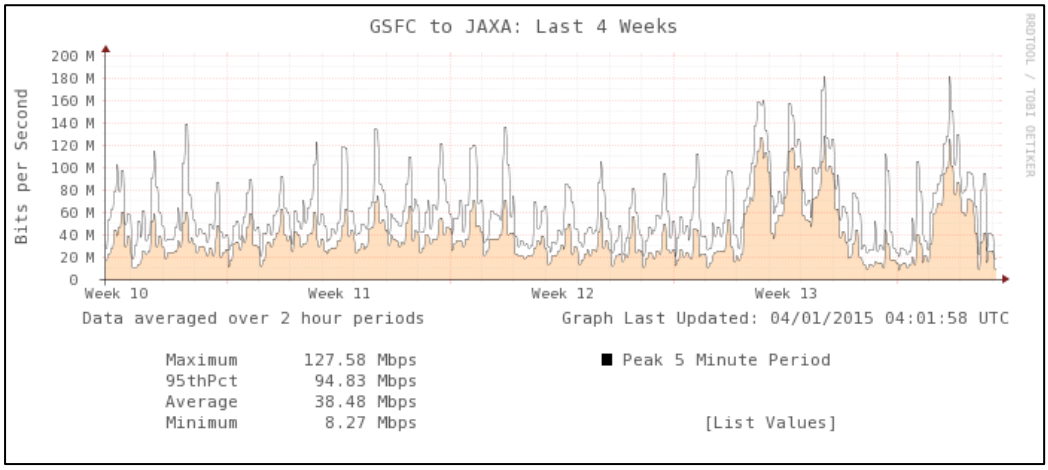
10) GSFC ←→ JAXA

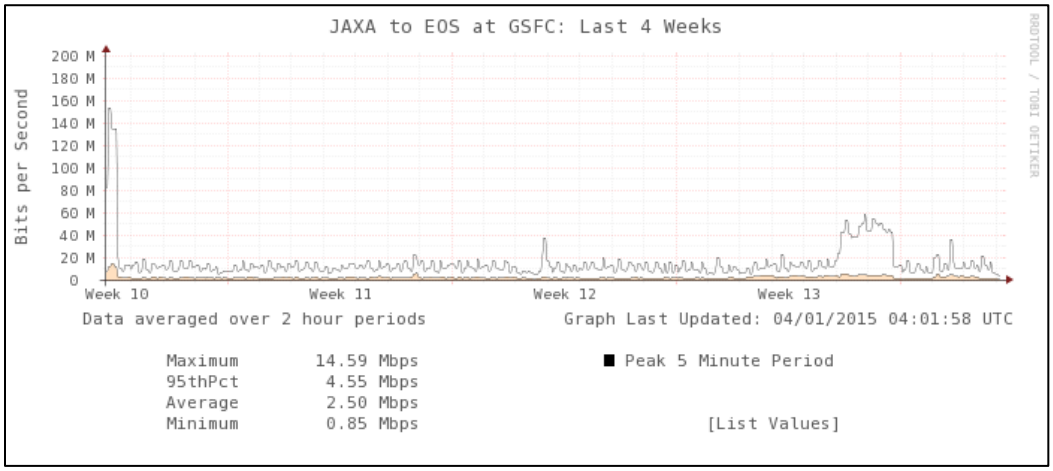
Ratings: GSFC ←→ JAXA: N/A

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009. No additional testing is planned for AMSR or TRMM. All testing to JAXA-TKSC for ALOS was terminated at the end of June '09. Tests have been conducted with JAXA to evaluate different file transfer protocols for GPM -- but those results are not suitable for this report.

However, the user flow between GSFC-EBnet and JAXA continues to be measured. As shown below, the user flow this month averaged 38.5 mbps from GSFC-EBnet to JAXA, and 2.5 mbps from JAXA to GSFC-EBnet.

The GSFC-EBnet and JAXA flow is well above the usual flow and the new database requirements of 15.4 mbps. The JAXA to GSFC-EBnet flow is consistent with the 3.3 mbps requirement. However, since no iperf tests are run, the true capability of the network cannot be determined, and therefore no rating is assigned.





For comparison, testing is performed from GSFC to a test node at the Tokyo Exchange point, which is on the route from GSFC to JAXA. Performance to the Tokyo-XP 10 gig server is well in excess of the JAXA requirements.